

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1 1. (Currently amended): A defect inspection apparatus comprising:
2 a mount for mounting a specimen;
3 an illumination light to illuminate the specimen;
4 an imaging optical system forming an image of the specimen, the imaging optical
5 system including an objective lens with a numerical aperture providing a resolution of at least
6 0.18 microns, when combined with the illumination light;
7 an opto-electrical converter positioned to detect the image of the specimen;
8 an auto-focus optical system including an illumination module and a detection
9 module, the illumination module providing illumination on a surface of the specimen at an
10 incident angle of at least 85 degrees relative to a normal of a surface of the specimen, the
11 detecting module detecting light from the illumination module and reflected by the specimen;
12 an adjuster for adjusting a focal position of the imaging optical system based on a
13 detection signal received from the auto-focus optical system; and
14 a detector which detects defects on the specimen by processing electronic signals
15 from the opto-electrical converter;
16 a temperature detector to measure temperature of the imaging optical system; and
17 a controller to control the adjuster using temperature information detected by the
18 temperature detector.

2. (Canceled)

1 3. (Original): Apparatus in claim 2 wherein the temperature detector
2 measures a temperature at or near the objective lens of the imaging optical system.

1 4. (Original): Apparatus in claim 2 wherein the controller predicts a focal
2 position offset based on temperature information detected by the temperature detector and a
3 previously estimated relationship between temperature and focal position offset and uses the
4 predicted focal position offset to control the adjuster based on the prediction.

1 5. (Currently amended): A defect inspection apparatus comprising:
2 means for mounting a specimen;
3 means for illuminating the specimen;
4 an imaging optical system ~~forming~~ which forms an optical image of said
5 illuminated specimen;
6 means for ~~opto-electrical conversion~~ detecting an optical image of said specimen
7 formed by said imaging optical system;
8 an auto-focus optical system ~~diagonally~~ obliquely illuminating a surface of said
9 specimen and detecting light reflected from said specimen;
10 means for measuring temperature of said imaging optical system;
11 means for adjusting a focal position of said imaging optical system based on a
12 detection signal from said auto-focus optical system and information about a temperature of said
13 imaging optical system measured by said temperature measuring means;
14 means for detecting defects on said specimen by processing ~~electronic signals~~
15 output from said ~~opto-electrical converting means~~ detecting an optical image; and
16 means for displaying, on a screen, information relating to defects of said specimen
17 detected by said ~~defect detecting means~~ for detecting defects.

1 6. (Original): A defect inspection apparatus as in claim 5 wherein said
2 imaging optical system includes an objective lens with a numerical aperture providing a
3 resolution of at least 0.18 microns, when combined with said illumination light from said
4 illuminating means.

1 7. (Original): A defect inspection apparatus as in claim 5 wherein said auto-
2 focus optical system provides illumination on a surface of said specimen mounted on said
3 mounting means at an incident angle of at least 85 degrees relative to a normal of said specimen
4 surface.

1 8. (Currently amended): A method for inspecting defects comprising the
2 following steps:

3 measuring a temperature of an imaging optical system;
4 illuminating a surface of a specimen at an angle relative to said surface;
5 detecting light ~~from said illumination~~ reflected by said specimen;
6 determining, based on a signal obtained by detecting light reflected from said
7 specimen, a focal position of ~~an~~ said imaging optical system used to form an optical image of a
8 surface of said substrate;
9 matching a height position of said specimen with said determined focal position;
10 illuminating said specimen at said matched height;
11 forming an optical image of said specimen using said imaging optical system
12 equipped with an objective lens ~~with a numerical aperture providing a resolution of at least 0.18~~
13 ~~microns, when combined with said illumination light from said illuminating means;~~
14 capturing an optical image of said specimen; ~~and~~
15 processing a signal obtained by capturing said optical image of said specimen and
16 detecting defects of said specimen; and
17 wherein said step of determining a focal position is based on said temperature of
18 said imaging optical system.

9. (Canceled)

1 10. (Original): A method for inspecting defects on a specimen as in claim 8
2 wherein temperature at or near said objective lens of said imaging optical system is measured.

1 11. (Currently amended): A method for inspecting defects on a specimen as
2 in claim 8 wherein:
3 a focal position offset is predicted based on temperature information detected by
4 ~~said a~~ temperature detecting means and a previously determined relationship between
5 temperature and focal position offset; and
6 a focal position of said imaging optical system is controlled based on said
7 prediction.

1 12. (Currently amended): A method for inspecting defects comprising the
2 following steps:
3 illuminating with a first light a surface of a specimen at an angle relative to said
4 surface;
5 ~~detecting light from said illumination reflected by said specimen;~~
6 measuring a temperature of an imaging optical system which has an objective
7 lens;
8 detecting light reflected from said surface of said specimen and determining,
9 based on ~~an obtained signal~~ obtained by said detecting and said measured temperature
10 information, a focal position of an imaging optical system;
11 ~~matching a height of~~ adjusting a relative position between said specimen ~~with and~~
12 said determined focal position;
13 illuminating said specimen with a second light at said matched height;
14 forming an optical image of said specimen illuminated by said ~~illumination~~
15 second light using said imaging optical system;
16 capturing an optical image of said specimen; and
17 processing a signal obtained by capturing said optical image of said specimen and
18 detecting defects of said specimen.

1 13. (Original): A method for inspecting defects as in claim 12 wherein a
2 temperature of said objective lens is measured in said step for measuring a temperature of said
3 imaging optical system.

1 14. (Original): A method for inspecting defects as in claim 12 wherein said
2 objective lens has a numerical aperture providing a resolution of at least 0.18 microns, when
3 combined with said illumination light from said illuminating means, and said optical image is
4 formed via said objective lens.

1 15. (Original): A method for inspecting defects as in claim 12 wherein said
2 light illuminating said surface of said specimen at an angle relative to said surface is illuminated
3 with an incident angle of at least 85 degrees relative to a normal of said specimen surface.

1 16. (New): A defect inspection apparatus as recited in claim 5, wherein said
2 means for adjusting adjusts a height of said specimen.

1 17. (New): A method for inspecting defects as recited in claim 12, wherein in
2 said step of adjusting, a height of said specimen is adjusted.

1 18. (New): A defect inspection apparatus as recited in claim 5, wherein said
2 means for illuminating illuminates a slit shape light on said specimen.

1 19. (New): A method for inspecting defects as recited in claim 12, wherein in
2 said step of illuminating, a slit shape light illuminates said surface of said specimen.